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Docket No. S-94,661
In Response to Office Action dated April 25, 2005

REMARKS

Claims 1-10 are pending in the present patent application. Claims 1-10 have been rejected.

The present Office Action is in response to Applicant's Appeal Brief filed on January 27, 2005. According to the present Office Action dated April 25, 2005, claims 1-8 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Pirrung et al. (WO 90/15070, hereby referred to as Pirrung) in view of Boris Yokhin (U. S. Patent Number 6,041,095, hereby referred to as Yokhin). According to the present Office Action, "...Pirrung teaches a method and device for preparing desired sequences on a substrate at known locations wherein bound material of the substrate is exposed to irradiation (pg. 10, lines 1-35) so as to activate material and permit binding (see abstract). The substrate has a variety of uses such as screening large numbers of peptides and receptors, wherein receptors are labeled with fluorescent markers for detection. Other applications of the invention include doping of organic material in the substrate (pg. 5, lines 14-36). In an alternative embodiment the surface may comprise of cage binding members that are capable of immobilizing receptors in predefined regions of a substrate for selective activation that allow receptors that have differential affinity for one or more ligands to react (pg. 55, lines 30-37 and pg. 56, lines 1-11). A specific binding substance having a strong binding affinity for the binding member and a strong affinity for the receptor or a conjugate of the receptor may be used to act as a bridge between binding members and receptors if desired. The method uses a receptor prepared such that the receptor retains its activity toward a particular ligand (pg. 56 lines 30-36). According [to] Pirrung et al., receptors used in this method could be organic compounds such as polymers (oligomer), nucleic acids, peptides, drugs, cellular membranes, cells, etc. (pg. 11, lines 7-24). The binder molecule can be selected from the group consisting of agonists and antagonists for cell membrane receptors, oligonucleotides, nucleic acids, proteins, antibodies, etc. (pg. 9, lines 30-37)...".

The present Office Action notes that "...the method of Pirrung et al. is silent with respect to X-ray fluorescence analysis...".

According to the Office Action, Yokhin teaches "...an apparatus for X-ray excitation of a sample and discloses in the background of the invention that this procedure is well known in the art for determining the elemental composition of a sample and that X-ray fluorescence is analyzed to find the energies or the wavelengths of the detected photons for qualitative and/or quantitative analysis (column 1, lines 9-20)...". The Office Action concluded that "...it would have been obvious to one of ordinary skill in the art to select or include x-ray fluorescence as taught by Yokhin in the variety of detection methods used by Pirrung to find the energies or the wavelength of the detected photons for qualitative and/or quantitative analysis (column 1, lines 9-20). One would be motivated to include x-ray fluorescence in the reference of Pirrung in view of the closely related methodology and sensitivity in the detection of binding events and expectation of success...". Applicant respectfully disagrees.

According to Yokhin, column 1, lines 9-20, x-ray fluorescence analyzers are well known instruments in the art for determining elemental compositions of a sample, and they include an x-ray source for irradiating a sample and an x-ray detector for detecting the x-ray fluorescence emitted by the sample in response to the x-ray irradiation. While Yokhin teaches x-ray fluorescence analyzers, Pirrung teaches the detection of chemical binding between chemicals and members of an array. Pirrung does not teach or suggest using x-ray fluorescence analyzers to detect chemical binding. Instead, Pirrung teaches using optical fluorescence to detect chemical binding, and Pirrung also teaches labeling the chemicals with optically fluorescent tags so that they can be detected using optical fluorescence. The Office Action notes that Pirrung is silent with respect to X-ray fluorescence analysis. However, the Office Action states that it would be obvious to include x-ray fluorescence as a detection method with Pirrung because x-ray fluorescence detection is already known and closely related to what Pirrung already teaches. Applicant submits that it would **not** be obvious to include x-ray fluorescence detection with Pirrung's other teachings. X-ray fluorescence detection is **not** close to Pirrung's other teachings. Using X-ray fluorescence detection to determine whether or not a binding event has occurred provides **benefits** not otherwise available from

Pirrung's teachings because it does not require the constraint of labeling chemicals with additional optically fluorescent tags that could affect the binding properties of the chemical. In contrast to Pirrung, in the present patent application, page 13 line 28 though page 14 line 3, Applicant teaches that "...although tagged materials are not required, they could also be used and this aspect of the invention offers a distinct advantage in that the invention can provide a direct comparison of binding affinity of the untagged binder with that of the corresponding tagged surrogate. This comparison could validate or invalidate the assumption that a particular untagged binder and its tagged surrogate have the same binding affinity to a particular substrate...".

Applicant submits that using X-ray fluorescence detection to detect a binding event is not taught or suggested by Pirrung's teachings. Applicant submits that there is no motivation in Pirrung or in Yokhin to modify Pirrung to obtain Applicant's claimed invention. Merely that x-ray fluorescence could be used as an alternative does not provide sufficient motivation to combine x-ray fluorescence detection with Pirrung's teachings. Furthermore, Applicant's specification is not prior art, and the suggestion for the combination of the references cannot come from Applicant's specification. Applicant's specification cannot be used as a parts-list to search for disparate parts in the art and then used as a blueprint to assemble the selected parts. The sources for the motive not only to select the parts (in this case, the steps) but also to the direction for reassembling them into the claimed combination to obtain the desired result must come from the references. These principles were not followed in this Office Action. The result is that the rejections under 35 U.S.C. 103(a) are unsound and should be withdrawn. For these reasons, Applicant submits that claims 1-8 and 10 are not obvious under U.S.C. 103(a) over Pirrung in view of Yokhin and respectfully requests that the rejection be withdrawn.

According to the present Office Action, claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pirrung et al in view of Boris Yokhin and further in view of Weinberg et al (U.S. Patent Number 6,030,917, hereby referred to as Weinberg). The Office Action states that the teachings of Pirrung and Yokhin are silent with respect to the binder being a metal ion. The Office Action also states that

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"...Weinberg et al teaches methods of screening and characterization of libraries of organometallic compounds which can be used as catalysts and therapeutic agents (see abstract). Ancillary ligand-stabilized metal complexes are also useful as catalysts for reactions such as oxidation, reduction, hydrogenation, polymerization, carbonylation and other reactions...". The Office Action concludes that "...it would have been obvious to one of ordinary skill in the art to use the metal ion binder of Weinberg et al in the method and device for preparing desired sequences on a substrate as taught by Pirrung et al in view of Yokhin to screen for therapeutic agents and catalysts that are useful in oxidation, reduction and other useful reactions...". Applicant respectfully disagrees.

Claim 9 is dependent from claim 1, and Applicant submits that claims 1-8 and 10 are not obvious over Pirrung in view of Yokhin as described above. Weinberg's teachings do not provide the motivation for combining the references to arrive at Applicant's claim 9. For these reasons, Applicant submits that claim 9 is not obvious over Pirrung in view of Yokhin and Weinberg and respectfully requests that the rejection of claim 9 under 35 U.S.C. 103(a) be withdrawn.

Applicant has added claims 11-20, which are concerned with the detection of a binding event between binders and receptors, where the binders are not labeled with optically fluorescent tags.

Applicant respectfully requests that this amendment be entered into the present patent application. For the reasons set forth above, Applicant believe that all currently pending claims are in condition for allowance, and such action at an early date is earnestly solicited. No new matter has been added by the above changes. Reexamination and reconsideration are respectfully requested.

Respectfully submitted,

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